AMENDMENTS TO THE CLAIMS

Without prejudice, please cancel claims 1-28, and add new claims 29-47, so that the claims read as follows:

1-28. (Cancelled).

29. (New) A process for producing a vinyl-cis-polybutadiene rubber, which comprises mixing (A) and (B), wherein

(A) comprises a vinyl-cis-polybutadiene solution where a proportion (HI) of a boiling n-hexane insoluble matter of the vinyl-cis-polybutadiene is from 10 to 60 % by weight, the vinyl-cis-polybutadiene being obtained by

(1) a step of adding a cis-1,4-polymerization catalyst, comprising a first organoaluminum compound and a soluble cobalt compound, to a mixture containing 1,3-butadiene and a hydrocarbon-based organic solvent as major components, where a water content is adjusted to a range of 0.1 to 1.0 moles of water per mole of the first organoaluminum compound, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization to obtain a resulting polymerization reaction mixture, and

(2) a step of exposing a second catalyst to the resulting polymerization reaction mixture, thereby subjecting 1,3-butadiene to 1,2-polymerization, wherein the second catalyst comprises a soluble cobalt compound, a second organoaluminum compound represented by the general formula AlR_3, and carbon disulfide, and wherein R represents an alkyl group having from 1 to 6 carbon atoms, a phenyl group, or a cycloalkyl group, and wherein

(B) comprises a cis-polybutadiene solution obtained by a step of adding said cis-1,4-polymerization catalyst to 1,3-butadiene to subject the 1,3-butadiene to cis-1,4-polymerization.

30. (New) The process according to claim 29, wherein the hydrocarbon-based organic solvent comprises cyclohexane, and wherein the second catalyst comprises, based on the resulting polymerization reaction mixture, 0.1 to 50 mmol of the second organoaluminum compound per mole of 1,3-butadiene and 0.01 to 10 mmol/L of the carbon disulfide.

31. (New) A process for producing a vinyl-cis-polybutadiene rubber, which comprises mixing (A) and (B), wherein

(A) comprises a vinyl-cis-polybutadiene solution where a proportion (HI) of a boiling n-hexane insoluble matter of the vinyl-cis-polybutadiene is from 10 to 60 % by weight, the vinyl-cis-polybutadiene being obtained by dissolving at least one member selected from the group consisting of previously polymerized polyisoprene, liquid polyisoprene, crystalline polybutadiene having a melting point of not higher than 150 °C, liquid polybutadiene, a styrene-isoprene-styrene compound, and derivatives thereof, in a mixture containing 1,3-butadiene and a hydrocarbon-based solvent as major components, and by

(1) a step of adding a cis-1,4-polymerization catalyst comprising a first organoaluminum compound and a soluble cobalt catalyst, a nickel catalyst, or a lanthanoid catalyst, to the mixture containing 1,3-butadiene and a hydrocarbon-based organic solvent as major components, wherein a water content is adjusted to a range of 0.1 to 1.0 moles of water per mole of the first organoaluminum compound, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization to obtain a resulting polymerization reaction mixture, and

(2) a step of exposing a second catalyst comprising a soluble cobalt compound, a second organoaluminum compound represented by the general formula AlR_3, and carbon disulfide, to the resulting polymerization reaction mixture, thereby subjecting the 1,3-butadiene to 1,2-polymerization, wherein R represents an alkyl group having from 1 to 6 carbon atoms, a phenyl group, or a cycloalkyl group, and wherein

(B) comprises a cis-polybutadiene solution obtained by a step of dissolving cis-polybutadiene containing 80 % or more of a cis-1,4-bond and having a Mooney viscosity (ML_{1+4} at 100 °C) of from 20 to 80 in a mixture containing 1,3-butadiene and/or a hydrocarbon-based organic solvent as a major component, wherein the cis-polybutadiene comprises a single kind or a blend of two or more kinds of cis-polybutadiene obtained by polymerization of 1,3-butadiene with a soluble cobalt catalyst, a nickel catalyst, or a lanthanoid catalyst.

32. (New) The process according to claim 31, wherein the hydrocarbon-based organic solvent comprises cyclohexane, and wherein the second catalyst comprises, based on the resulting polymerization reaction mixture, 0.1 to 50 mmol of the second organoaluminum compound per mole of 1,3-butadiene and 0.01 to 10 mmol/L of the carbon disulfide.

33. (New) A process for producing a vinyl-cis-polybutadiene rubber, which comprises mixing (A) and (B), wherein

(A) comprises a vinyl-cis-polybutadiene solution where a proportion (HI) of a boiling n-hexane insoluble matter of the vinyl-cis-polybutadiene is from 10 to 60 % by weight, the vinyl-cis-polybutadiene being obtained by

(1) a step of dissolving cis-polybutadiene containing 80 % or more of a cis-1,4-bond and having a Mooney viscosity (ML_{1+4} at 100 °C) of from 20 to 80 in a mixture containing 1,3-butadiene and a hydrocarbon-based organic solvent as the major components to obtain a resulting cis-polybutadiene solution, wherein the cis-polybutadiene comprises a single kind or a blend of two or more kinds of cis-polybutadiene obtained by polymerization of 1,3-butadiene with a cobalt catalyst or a nickel catalyst or a lanthanoid catalyst, and

(2) a step of exposing a 1,2-polymerization catalyst to the resulting cis-polybutadiene solution, thereby subjecting 1,3-butadiene to 1,2-polymerization, wherein the 1,2-polymerization catalyst comprises a soluble cobalt compound, an organoaluminum compound represented by the general formula AlR_3 and carbon disulfide, wherein R represents an alkyl group having from 1 to 6 carbon atoms, a phenyl group, or a cycloalkyl group, and wherein

(B) comprises a cis-polybutadiene solution obtained by a step of adding a cis-1,4-polymerization catalyst to 1,3-butadiene, thereby subjecting 1,3-butadiene to cis-1,4-polymerization.

34. (New) The process according to claim 33, wherein the hydrocarbon-based organic solvent comprises cyclohexane, and wherein the 1,2-polymerization catalyst comprises, based on the resulting cis-polybutadiene solution, 0.1 to 50 mmol of the organoaluminum compound per mole of 1,3-butadiene and 0.01 to 10 mmol/L of the carbon disulfide.

35. (New) The process for producing a vinyl-cis-polybutadiene rubber according to claim 33, including a step of dissolving at least one member selected from the group consisting of previously polymerized polyisoprene, liquid polyisoprene, crystalline polybutadiene having a melting point of not higher than 150 °C, liquid polybutadiene, a styrene-isoprene-styrene compound, and derivatives thereof in the mixture containing 1,3-butadiene and a hydrocarbon-based solvent as the major components prior to initiation of the 1,2-polymerization in step (A)(2).

36. (New) A process for producing a vinyl-cis-polybutadiene rubber, which comprises mixing (A) and (B), wherein

(A) comprises a vinyl-cis-polybutadiene solution where a proportion (HI) of a boiling n-hexane insoluble matter of the vinyl-cis-polybutadiene is from 10 to 60 % by weight, the vinyl-cis-polybutadiene being obtained by

(1) dissolving cis-polybutadiene containing 80 % or more of a cis-1,4-bond and having a Mooney viscosity (ML_{1+4} at 100 °C) of from 20 to 80 in a mixture containing 1,3-butadiene and a hydrocarbon-based organic solvent as the major components to obtain a resulting cis-polybutadiene solution, and wherein the cis-polybutadiene comprises a single kind or a blend of two or more kinds of cis-polybutadiene obtained by polymerization of 1,3-butadiene with a soluble cobalt catalyst, a nickel catalyst, or a lanthanoid catalyst, and

(2) a step of exposing a 1,2-polymerization catalyst to the resulting cis-polybutadiene solution, thereby subjecting the 1,3-butadiene to 1,2-polymerization, wherein the 1,2-polymerization catalyst comprises a soluble cobalt compound, an organoaluminum compound represented by the general formula AlR_3, and carbon disulfide, and wherein R represents an alkyl group having from 1 to 6 carbon atoms, a phenyl group, or a cycloalkyl group, and wherein

(B) comprises a cis-polybutadiene solution obtained by a step of dissolving cis-polybutadiene containing 80 % or more of a cis-1,4-bond and having a Mooney viscosity (ML_{1+4} at 100 °C) of from 20 to 80 in a mixture containing 1,3-butadiene and/or a hydrocarbon-based organic solvent as a major component, wherein the cis-polybutadiene comprises a single kind or

a blend of two or more kinds of cis-polybutadiene obtained by polymerization of 1,3-butadiene with a soluble cobalt catalyst, a nickel catalyst, or a lanthanoid catalyst.

37. (New) The process according to claim 36, wherein the hydrocarbon-based organic solvent comprises cyclohexane, and wherein the 1,2-polymerization catalyst comprises, based on the resulting cis-polybutadiene solution, 0.1 to 50 mmol of the organoaluminum compound per mole of 1,3-butadiene and 0.01 to 10 mmol/L of the carbon disulfide.

38. (New) A rubber composition for tire sidewalls comprising 100 parts by weight of a rubber component made of

(a) from 20 to 80 % by weight of a vinyl-cis-polybutadiene rubber resulting from solution mixing (A) and (B), wherein

(A) comprises vinyl-cis-polybutadiene obtained by

(1) a step of adding a cis-1,4-polymerization catalyst comprising an organoaluminum compound and a soluble cobalt compound to a mixture containing 1,3-butadiene and a hydrocarbon-based organic solvent as the major components and having an adjusted water content, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization to form a resulting polymerization reaction mixture, and subsequently,

(2) a step of exposing a second catalyst to the resulting polymerization reaction mixture, thereby subjecting the 1,3-butadiene to 1,2-polymerization, wherein the second catalyst comprises a soluble cobalt compound, an organoaluminum compound represented by the general formula AlR_3, and carbon disulfide, wherein R represents an alkyl group having from 1 to 6 carbon atoms, a phenyl group, or a cycloalkyl group, wherein a proportion (HI) of a boiling n-hexane insoluble matter of the vinyl-cis-polybutadiene is from 10 to 60 % by weight, and wherein

(B) comprises cis-polybutadiene obtained by a step of adding said cis-1,4-polymerization catalyst to 1,3-butadiene to subject 1,3-butadiene to cis-1,4-polymerization, and

(b) from 80 to 20 % by weight of a diene-based rubber other than (a); and the rubber composition further comprising

(c) from 25 to 60 parts by weight of a rubber reinforcing agent.

39. (New) The rubber composition according to claim 38, wherein the rubber reinforcing agent (c) is carbon black.

40. (New) The rubber composition according to claim 38 wherein the diene-based rubber (b) other than (a) is a natural rubber and/or polyisoprene.

41. (New) A silica compounded rubber composition for tires comprising 100 parts by weight of a rubber component made of

(a) from 20 to 80 % by weight of a vinyl-cis-polybutadiene rubber resulting from solution mixing (A) and (B), wherein

(A) comprises vinyl-cis-polybutadiene obtained by

(1) a step of adding a cis-1,4-polymerization catalyst comprising an organoaluminum compound and a soluble cobalt compound to a mixture containing 1,3-butadiene and a hydrocarbon-based organic solvent as the major components and having an adjusted water content, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization to provide a resulting polymerization reaction mixture, and subsequently,

(2) a step of exposing a second catalyst to the resulting polymerization reaction mixture thereby subjecting the 1,3-butadiene to 1,2-polymerization, the second catalyst comprising a soluble cobalt compound, an organoaluminum compound represented by the general formula AlR_3, and carbon disulfide, wherein R represents an alkyl group having from 1 to 6 carbon atoms, a phenyl group, or a cycloalkyl group, and wherein a proportion (HI) of a boiling n-hexane insoluble matter of the vinyl-cis-polybutadiene is from 10 to 60 % by weight, and

(B) cis-polybutadiene obtained by a step of adding said cis-1,4-polymerization catalyst to 1,3-butadiene, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization, and

(b) from 80 to 20 % by weight of a diene-based rubber other than (a); and the silica compound rubber composition further comprising

(c) from 40 to 100 parts by weight of a rubber reinforcing agent containing 40 % or more of silica.

42. (New) The rubber composition according to claim 41, wherein the diene-based rubber (b) other than (a) is a natural rubber and/or polyisoprene and/or a styrene-butadiene rubber.

43. (New) A rubber composition for passenger automobile tires comprising 100 parts by weight of a rubber component made of

(a) from 10 to 50 % by weight of a vinyl-cis-polybutadiene rubber resulting from solution mixing

(A) vinyl-cis-polybutadiene obtained by

(1) a step of adding a cis-1,4-polymerization catalyst comprising an organoaluminum compound and a soluble cobalt compound to a mixture containing 1,3-butadiene and a hydrocarbon-based organic solvent as the major components and having an adjusted water content, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization to provide a resulting polymerization reaction mixture, and subsequently,

(2) a step of exposing the resulting polymerization reaction mixture to a second catalyst, thereby subjecting the 1,3-butadiene to 1,2-polymerization, the second catalyst comprising a soluble cobalt compound, an organoaluminum compound represented by the general formula AlR_3, and carbon disulfide, wherein R represents an alkyl group having from 1 to 6 carbon atoms, a phenyl group, or a cycloalkyl group, wherein a proportion (HI) of a boiling n-hexane insoluble matter of the vinyl-cis-polybutadiene is from 10 to 60 % by weight, and

(B) cis-polybutadiene obtained by a step of adding said cis-1,4-polymerization catalyst to 1,3-butadiene, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization,

(d) from 30 to 70 % by weight of a styrene-butadiene rubber, and

(b) from 0 to 60 % by weight of a diene-based rubber other than (a) and (d); and the rubber composition further comprising

(c) from 40 to 100 parts by weight of a rubber reinforcing agent.

44. (New) A rubber composition for tire cord coating comprising 100 parts by weight of a rubber component made of

(a) from 10 to 60 % by weight of a vinyl-cis-polybutadiene rubber resulting from solution mixing

(A) vinyl-cis-polybutadiene obtained by

(1) a step of adding a cis-1,4-polymerization catalyst comprising an organoaluminum compound and a soluble cobalt compound to a mixture containing 1,3-butadiene and a hydrocarbon-based organic solvent as the major components and having an adjusted water content, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization to provide a resulting polymerization reaction mixture, and subsequently,

(2) a step of exposing a second catalyst to the resulting polymerization reaction mixture, thereby subjecting 1,3-butadiene to 1,2-polymerization, wherein the second catalyst comprises a soluble cobalt compound, an organoaluminum compound represented by the general formula AlR_3, and carbon disulfide, wherein R represents an alkyl group having from 1 to 6 carbon atoms, a phenyl group, or a cycloalkyl group), wherein a proportion (HI) of a boiling n-hexane insoluble matter of the vinyl-cis-polybutadiene is from 10 to 60 % by weight, and

(B) cis-polybutadiene obtained by a step of adding said cis-1,4-polymerization catalyst to 1,3-butadiene, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization, and

(b) from 90 to 40 % by weight of a diene-based rubber other than (a); and the rubber composition further comprising

(c) from 30 to 80 parts by weight of a rubber reinforcing agent.

45. (New) A rubber composition for tire base treads comprising 100 parts by weight of a rubber component made of

(a) from 20 to 80 % by weight of a vinyl-cis-polybutadiene rubber resulting from solution mixing

(A) vinyl-cis-polybutadiene obtained by

(1) a step of adding a cis-1,4-polymerization catalyst comprising an organoaluminum compound and a soluble cobalt compound to a mixture containing 1,3-butadiene and a hydrocarbon-based organic solvent as the major components and having an adjusted water content, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization to provide a resulting polymerization reaction mixture, and subsequently,

(2) a step of exposing a second catalyst to the resulting polymerization reaction mixture, thereby subjecting the 1,3-butadiene to 1,2-polymerization, the second catalyst comprising a soluble cobalt compound, an organoaluminum compound represented by the general formula AlR_3, and carbon disulfide, wherein R represents an alkyl group having from 1 to 6 carbon atoms, a phenyl group, or a cycloalkyl group), wherein a proportion (HI) of a boiling n-hexane insoluble matter of the vinyl-cis-polybutadiene is from 10 to 60 % by weight, and

(B) cis-polybutadiene obtained by a step of adding said cis-1,4-polymerization catalyst to 1,3-butadiene, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization, and

(b) from 80 to 20 % by weight of a diene-based rubber other than (a); and the rubber composition further comprising

(c) from 22 to 55 parts by weight of a rubber reinforcing agent.

46. (New) A high-hardness compounded rubber composition comprising 100 parts by weight of a rubber component made of

(a) from 20 to 80 % by weight of a vinyl-cis-polybutadiene rubber resulting from solution mixing

(A) vinyl-cis-polybutadiene obtained by

(1) a step of adding a cis-1,4-polymerization catalyst comprising an organoaluminum compound and a soluble cobalt compound to a mixture containing 1,3-butadiene and a hydrocarbon-based organic solvent as the major components and having an adjusted water content, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization to provide a resulting polymerization reaction mixture, and subsequently,

(2) a step of exposing a second catalyst to the resulting polymerization reaction mixture, the second catalyst comprising a soluble cobalt compound, an organoaluminum compound represented by the general formula AlR_3, and carbon disulfide, wherein R represents an alkyl group having from 1 to 6 carbon atoms, a phenyl group, or a cycloalkyl group), and wherein a proportion (HI) of a boiling n-hexane insoluble matter of the vinyl-cis-polybutadiene is from 10 to 60 % by weight, and

(B) cis-polybutadiene obtained by a step of adding said cis-1,4-polymerization catalyst to 1,3-butadiene, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization, and

(b) from 80 to 20 % by weight of a diene-based rubber other than (a); and the compounded rubber composition further comprising

(c) from 60 to 100 parts by weight of a rubber reinforcing agent.

47. (New) A rubber composition for large-sized vehicle tires comprising 100 parts by weight of a rubber component made of

(a) from 10 to 60 % by weight of a vinyl-cis-polybutadiene rubber resulting from solution mixing

(A) vinyl-cis-polybutadiene obtained by

(1) a step of adding a cis-1,4-polymerization catalyst comprising an organoaluminum compound and a soluble cobalt compound to a mixture containing 1,3-butadiene and a hydrocarbon-based organic solvent as the major components and having an adjusted water content, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization to obtain a resulting polymerization reaction mixture, and subsequently,

(2) a step of exposing a second catalyst to the resulting polymerization reaction mixture, thereby subjecting the 1,3-butadiene to 1,2-polymerization, wherein the second catalyst comprises a soluble cobalt compound, an organoaluminum compound represented by the general formula AlR_3, and carbon disulfide, wherein R represents an alkyl group having from 1 to 6 carbon atoms, a phenyl group, or a cycloalkyl group, wherein a proportion (HI) of a boiling n-hexane insoluble matter of the vinyl-cis-polybutadiene is from 10 to 60 % by weight, and

(B) cis-polybutadiene obtained by a step of adding said cis-1,4-polymerization catalyst to 1,3-butadiene, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization, and

(b) from 90 to 40 % by weight of a diene-based rubber other than (a); and the rubber composition further comprising

(c) from 45 to 70 parts by weight of a rubber reinforcing agent.